

CLAIMS

What is claimed as being new and desired to be protected by LETTERS PATENT of the United States is as follows:

1. A desiccant dehumification system comprising:

a housing partitioned into a first and second air chamber each for passing air therethrough, each said air chamber having an inlet for intake of air and an outlet for exhausting air;

a rotating desiccant wheel positioned inside said housing and across said air chambers;

an air transmitting means positioned within said first air chamber for drawing return air from a structure into said first air chamber and passing said air across said desiccant wheel to remove moisture from said return air and exhausting into the structure as conditioned air;

an air transmitting means positioned within said second air chamber for drawing a source air into said second air chamber, across said desiccant wheel to remove moisture from said desiccant wheel and exhausting from said second air chamber;

an air heating means positioned in said second air chamber upstream of said desiccant wheel for heating said source air to be passed over said desiccant wheel; and

a conduit in operational connection between at least one said air transmitting means and said air heating means for passing pressurized air to said air heating means.

2. The desiccant dehumidification system of claim 1 wherein said conduit is in operational connection between said air transmitting means in said first air chamber and said air heating means for passing pressurized return air to said air heating means.

3. The desiccant dehumidification system of claim 1 wherein said conduit is in operational connection between said air transmitting means in said second air chamber and said air heating means for passing pressurized source air to said air heating means.

4. The desiccant dehumidification system of claim 1 wherein said conduit is in operational connection between said air transmitting means in said first air chamber and said air heating means for passing pressurized return air to said air heating means and said air transmitting means in said second air chamber and said air heating means for passing pressurized source air to said air heating means.

5. A desiccant air cooling system, said desiccant air cooling system comprising:

an air cooling means for cooling a return air from a structure and recirculating the cooled returned air to the structure; and

a desiccant dehumidification system comprising:

a housing partitioned into a first and second air chamber each for passing air therethrough, each said air

chamber having an inlet for intake of air and an outlet for exhausting of air;

a rotating desiccant wheel positioned inside said housing and across said air chambers;

an air transmitting means positioned within said first air chamber for drawing a portion of said cooled return air into said first air chamber and passing said cooled return air across said desiccant wheel to remove moisture from said cooled return air and exhausting into the structure as conditioned air;

an air transmitting means positioned within said second air chamber for drawing a source air into said second air chamber, across said desiccant wheel to remove moisture from said desiccant wheel and exhausting from said second air chamber; and

an air heating means positioned in said second air chamber upstream of said desiccant wheel for heating said source air to be passed over said desiccant wheel.

6. The system of claim 5 further including a conduit in operational connection between at least one said air transmitting means and said air heating means for passing pressurized air to said air heating means.

7. The system of claim 6 wherein said conduit is in operational connection between said air transmitting means in said first air chamber and said air heating means for passing pressurized return air to said air heating means.

8. The system of claim 6 wherein said conduit is in operational connection between said air transmitting means in said second air chamber and said air heating means for passing pressurized source air to said air heating means.

9. The system of claim 6 wherein said conduit is in operational connection between said air transmitting means in said first air chamber and said air heating means for passing pressurized return air to said air heating means and said air transmitting means in said second air chamber and said air heating means for passing pressurized source air to said air heating means.

10. A desiccant air cooling system, said desiccant air cooling system comprising:

an air mixing means for mixing a return air from a structure with a fresh air to form a mixed air;

a housing partitioned into a first and second air chamber each for passing air therethrough, each said air chamber having an inlet for intake of air and an outlet for exhausting of air;

a rotating desiccant wheel positioned inside said housing and across said air chambers;

a cooling means positioned within said first air chamber;

an air transmitting means positioned within said first air chamber for drawing said mixed air into said first air chamber and passing said mixed air across said desiccant wheel to remove moisture from said mixed air, across said cooling means and exhausting into the structure as conditioned air;

an air transmitting means positioned within said second air chamber for drawing a source air into said second air chamber, across said desiccant wheel to remove moisture from said desiccant wheel and exhausting from said second air chamber; and

an air heating means positioned in said second air chamber upstream of said desiccant wheel for heating said source air to be passed over said desiccant wheel.

11. The system of claim 5 further including a conduit in operational connection between at least one air transmitting means and said air heating means for passing pressurized air to said air heating means.

12. The system of claim 11 wherein said conduit is in operational connection between said air transmitting means in said first air chamber and said air heating means for passing pressurized return air to said air heating means.

13. The system of claim 11 wherein said conduit is in operational connection between said air transmitting means in said second air chamber and said air heating means for passing pressurized source air to said air heating means.

14. The system of claim 11 wherein said conduit is in operational connection between said air transmitting means in said first air chamber and said air heating means for passing pressurized return air to said air heating means and said air transmitting means in said second air chamber and said air heating means for passing pressurized source air to said air heating means.

15. A method of reducing the humidity of air to maintain a desired humidity and temperature of air in a structure comprising the steps of:

drawing return air from a structure into a first air chamber;

passing said return air across a portion of a desiccant wheel removing moisture from said return air;

exhausting said return air as conditioned air into the structure;

drawing a source air into a second air chamber;

passing said source air through a gas fired heater to heat said source air;

passing said heated source air across a portion of said desiccant wheel removing moisture from said desiccant wheel;

exhausting said source air from said second chamber; and

charging said gas fired heater with an air stream from at least one of said first or said second chamber.

16. The method of claim 15 wherein said air heater is charged by an air stream from said first air chamber.

17. The method of claim 15 wherein said air heater is charged by an air stream from said second air chamber.

18. The method of claim 15 wherein said air heater is charged by an air stream from said first air chamber and an air stream from said second air chamber.

19. The method of claim 15 further including the step of cooling said return air before passing through said desiccant wheel.

20. The method of claim 16 further including the step of cooling said return air before passing through said desiccant wheel.

21. The method of claim 17 further including the step of cooling said return air before passing through said desiccant wheel.

22. The method of claim 18 further including the step of cooling said return air before passing through said desiccant wheel.

23. The method of claim 15 further including the step of mixing said return air with fresh air before transmitting said return air through said first chamber.

24. The method of claim 15 further including the step of cooling said return air after passing through said desiccant wheel and before being exhausted into the structure.

25. The method of claim 23 further including the step of cooling said return air after passing through said desiccant wheel and before being exhausted into the structure.

26. The method of claim 25 wherein said air heater is charged by an air stream from said first air chamber.

27. The method of claim 25 wherein said air heater is charged by an air stream from said second air chamber.

28. The method of claim 25 wherein said air heater is charged by an air stream from said first air chamber and an air stream from said second air chamber.